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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number	10/670,531
Filing Date	September 26, 2003
First Named Inventor	Castleberry
Art Unit	
Examiner Name	
Attorney Docket Number	X-9425

ENCLOSURES *(Check all that apply)*

- [x] Fee Transmittal Form
  - [x] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Reply to Missing Parts/ Incomplete Application
  - [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
  - [ ] Landscape Table on CD
- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [x] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [ ] Other Enclosure(s) (please Identify below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Gipple & Hale		
Signature			
Printed name	John S. Hale		
Date	November 2, 2005	Reg. No.	25,209

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature			
Typed or printed name		Date	

PTO/SB/17 (12-04v2)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005

☑ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 250.00

Complete if Known	
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Attorney Docket No.	X-9425

METHOD OF PAYMENT (check all that apply)

☑ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☑ Deposit Account Deposit Account Number: 07-1340 Deposit Account Name: GIPPLE & HALE

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee ($)	Fee Paid ($)
_____ - 20 or HP =	_____	x _____	= _____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee ($)	Fee Paid ($)
_____ - 3 or HP =	_____	x _____	= _____

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims Fee ($)	Multiple Dependent Claims Fee Paid ($)
_____	_____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
_____ - 100 =	_____ / 50 =	_____ (round up to a whole number) x	_____	= _____

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other (e.g., late filing surcharge): Appeal Brief	250.00

SUBMITTED BY

Signature		Registration No. (Attorney/Agent) 25,209	Telephone 703-448-1770
Name (Print/Type)	John S. Hale/Gipple & Hale		Date November 2, 2005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of	:	
CASTLEBERRY	:	
Serial No.: 10/670,531	:	Examiner Gellner
Filed: September 26, 2003	:	Group Art Unit 3643
For: AGRICULTURAL FOAM GROWING MATERIAL	:	

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF

TABLE OF CONTENTS

TABLE OF CASES ii

STATEMENT 1

REAL PARTY IN INTEREST 2

RELATED APPEALS AND INTERFERENCES 2

STATUS OF THE CLAIMS 2

STATUS OF THE AMENDMENTS 2

SUMMARY OF THE INVENTION 2

ISSUES PRESENTED 3

(1) Whether the invention as defined in Claims 1-15 are unpatentable under 35 USC 103(a) over the cited prior art references to Pruitt U.S. Patent Number 2,988,441 in view of Garrett U.S. Patent Number 5,617,672 3

(2) Whether the invention as defined in Claims 16-23, 25, and are unpatentable under 35 USC 103(a) over the cited prior art references US Rubinate/Suprasec publication in view of Pruitt U.S. Patent Number 2,988,441 3

GROUPING OF THE CLAIMS 3

ARGUMENT 4

(1) The Examiner's rejection of Claims 1-15 under 35 USC 103(a) as unpatentable over Pruitt U.S. Patent Number 2,988,441 in view of Garrett U.S. Patent Number 5,617,672 is not correct and should be reversed 4

(2) The Examiner's rejection of Claims 16-23, 25 and 26 under 35 USC 103(a) as unpatentable over US Rubinate/Suprasec in view of Pruitt '441 is not correct and should be reversed 10

SUMMARY OF ARGUMENT 14

APPENDIX 16

TABLE OF CASES

Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Int. 1993)..... 9

In re Baird, 29 USPQ2d 1550 (Fed. Cir. 1994)..... 9

In re Clinton, 527 F.2d 1226, 188 U.S.P.Q. 365 (C.C.P.A.1976)..... 9

In re Dow Chem., 837 F.2d 469, 5 U.S.P.Q.2d 1529 (Fed. Cir. 1988)..... 8, 13

In re Gordon, 733 F.2d 900, 221 U.S.P.Q. 1125 (Fed. Cir.1984)..... 9, 14

In re Laskowski, 871 F.2d 115, 10 U.S.P.Q.2d 1397 (Fed. Cir. 1989)..... 9

Minnesota Mining & Manufacturing Co. v. Johnson &Johnson Orthopaedics, Inc., 24 USPQ2d 1321 (Fed. Cir 1992)..... 9, 14

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For: AGRICULTURAL FOAM GROWING MATERIAL	:	

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF

STATEMENT

This Brief is filed in support of the Applicant's appeal of the Examiner's Final Rejection dated March 4, 2005 rejecting Claims 1-23, 25 and 26. The Final Rejection was in response to Applicant's Amendment of December 28, 2004. A Response together with a Three Month Extension of Time and a Notice of Appeal was timely filed on September 2, 2005. The Response was not entered by the Examiner in an Advisory Action of September 14, 2005 as being not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal.

REAL PARTY IN INTEREST

The party named in the caption of the brief is the real party in interest.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Applicant which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF THE CLAIMS

Claims 1-15 are rejected under 35 USC 103(a) as unpatentable over Pruitt U.S. Patent Number 2,988,441 in view of Garrett U.S. Patent Number 5,617,672. Claims 16-23, 25 and 26 have been rejected under 35 USC 103(a) as unpatentable over the publication US Rubinate/Suprasec in view of Pruitt '441 patent. Claims 1-23, 25 and 26 are being appealed.

STATUS OF THE AMENDMENTS

The Examiner issued a final rejection on March 4, 2005 rejecting the claims currently in the case. A Response was made after the final rejection presenting arguments as to why the combined cited references were not valid prior art. This response was refused entry as not being deemed to place the application in better form for appeal by materially reducing or simplifying the issue on appeal.

SUMMARY OF THE INVENTION

The invention is directed toward a horticultural growing medium formed of a sterile flexible

diphenylmethane diisocyanate (MDI) foam material with a cation exchange capacity (C.E.C.) ranging from about 1.0 to about 1.5 milliequivalents (meg)/100 g. The foam material has at least 50% of its pores by foam volume ranging in size from 10 to 200 microns with a total porosity ranging from 85% to 95% and being capable of supporting plant growth.

ISSUES PRESENTED

(1) Whether the invention as defined in Claims 1-15 are unpatentable under 35 USC 103(a) over the cited prior art references to Pruitt U.S. Patent Number 2,988,441 in view of Garrett U.S. Patent Number 5,617,672.

(2) Whether the invention as defined in Claims 16-23, 25, and are unpatentable under 35 USC 103(a) over the cited prior art references US Rubinate/Suprasec publication in view of Pruitt U.S. Patent Number 2,988,441.

GROUPING OF THE CLAIMS

The claims should be grouped into two groups, Group I comprising Claims 1-15 directed toward a horticultural growing medium capable of supporting plant growth constructed of a flexible diphenylmethane diisocyanate (MDI) foam material with a cation exchange capacity (C.E.C.) ranging from about 1.0 to about 1.5 milliequivalents (meg)/100 g and Group II comprising claims 16-23, 25 and 26 directed towards a horticultural growing medium capable of supporting plant growth comprising a substantially sterile unfilled foam material made of polymeric diphenylmethane diisocyanate taken from a group consisting of one or more of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), crude MDI, products of crude diaminodiphenyl methane including polymeric

MDI or a mixture of the same, having at least 50 of its pores ranging in size between 10 and 200 microns with a cation exchange capacity ranging from about 1.0 to about 1.5 and a total porosity ranging from about 85% to about 95%

ARGUMENT

(1) The Examiner's rejection of Claims 1-15 under 35 USC 103(a) as unpatentable over Pruitt U.S. Patent Number 2,988,441 in view of Garrett U.S. Patent Number 5,617,672 is not correct and should be reversed.

Claims 1-15 are directed toward a horticultural growing medium capable of supporting plant growth in the form of a diphenylmethane diisocyanate unfilled foam material having a cation exchange capacity (C.E.C.) ranging from about 1.0 to about 1.5 milliequivalents (meg)/100 g. The material has pore sizes of various ranges in various percentages and a total porosity ranging from 85% to 95%.

The Garrett '672 reference is directed toward a soil additive using a foam having a bulk density of approximately 1 pound per cubic foot. This reference can be dismissed in its entirety as it is directed to ureaformaldehyde foam. As noted on Col 4 lns 59-63: "Generally, the present invention is directed to a plant growth media comprising a ureaformaldehyde foam that can be used to control the growth rate of the plants or to decrease the growth rate of the plants" The foam in powdered form is added to a soil formulation such as natural soils, potting soil, peatlite, vermiculite, peat moss and mixtures thereof. There is filler material in the foam (carbohydrates additives) under any interpretation of the specification., either in powder form mixed with soil or as a hydrophonics block. It is readily understood by one of ordinary skill in the art that **ureaformaldehyde foam is made from reacting formaldehyde and urea and is totally different in composition and**

structure in relation to the unique foam of the present invention.

Furthermore as noted in Col. 5 lns. 19 26 "In a preferred embodiment of the present invention, the ureaformaldehyde foam used is a foam marketed under the trade name PLASTSOIL, which can be obtained from Coverfoam Services, Inc. Located in Florance, S.C. PLASTSOIL, which is a predominantly open celled hydrophilic foam, has **an appearance similar to that of "cotton candy" and has a bulk density of approximately 1 pound per cubic foot."** The present inventive foam is totally different in structure.

Garrett '672 also does not show any cation exchange capacity (hereinafter C.E.C.) for the material, relying upon the organic composition (filler) of the mixture and the carbohydrate additives to provide same. PLASTSOIL is a cellular plastic composition made from reacting form aldehyde and urea in particular concentration unique to PLASTSOIL, carbohydrate such as glucose, fructose, malose and sucrose can be incorporated into the foam (col. 5, lns. 34-49) * * * **Although unknown, it is possible that the unexpected results achieved by the process of the present invention (Garrett '672) are attributable to the carbohydrate additives.** (Col. 5, lns. 46-49).

Where used in the process of the present invention, PLASTSOIL is broken down and used in powdered form. (Col. 5, lns. 55-57).

When using the ureaformaldehyde foam in accordance with the '672 invention, the foam in powdered form is preferably mixed with a conventional soil formulation and used as a plant growth medium. The foam can be added to a soil formulation in amounts from about 5% to 90% by volume depending upon the circumstances and results desired (col. 5, lns. 58-66). It should be noted that Ureaformaldehyde foam has a residue (ppm) of formaldehyde remaining in the foam material. Garrett '572 does not teach pore size or porosity, C.E.C.the use of foam without a filler or a sterile

foam.

The Pruitt '441 reference is directed towards a medium for the growth and propagation of potted plants using polyurethane, rubber and vinyl resins having added synthetic ion exchange resins to produce an open celled foam. It is an object of the invention to provide a nutrient containing foamed matrix, an MDI based foam. As noted in Col 2 lns. 17-24 "It has been discovered that when polymeric materials which are foamable to form a stable open-celled foam structure are mixed with plant nutrients in chemical combination with a water-insoluble ion exchange resin and thereafter foamed, stable synthetic water-insoluble foamed product results which provides a unitary plant growing medium for intensive plant culture." The term plant nutrients is defined to mean calcium, nitrogen, phosphorous, sulfur, potassium and magnesium. The invention also embraces the additions of micronutrients; boron, manganese, iron, zinc, molybdenum and copper which are necessary for intensive plant growth. These nutrients are supplied in chemical concentrations with water insoluble synthetic ion exchange resins. As further noted on Col 2. Lns 51 - 55 "The invention is particularly concerned with a matrix prepared from the three major classes of resins known to produce open celled foam structure, namely, the polyurethanes, the rubbers and the vinyl foams, * * * ." Garnett does not use any of these three classes of foams.

As noted on col. 5, lns. 24-31, "The preferred foam matrix according to the present invention (the '441 patent) is a polyurethane or modified polyrethane foam **matrix** wherein a polyester or polyether resin, diisocyanate, nutrient charged ion exchange resin, modifying agent (if employed) and a foaming catalyst comprising a water-catalyst mixture are reacted together according to any of the three foam-producing methods or modifications thereof."

It would not be obvious to one of ordinary skill in the art at the time of the present invention

to modify the medium of Pruitt '441 by eliminating the filler because **unfilled polyurethane foam is not hydrophilic nor does it have a C.E.C. of from 1.0 to 1.5.** To overcome an inherently poor C.E.C., Pruitt adds a synthetic anion exchange resin (col. 13, lns. 57-75) and adds an inert compound having a high water-holding capacity in order to render the matrix hydrophilic (See example 1).

In the present invention it was unexpected that the invented foam formulation would produce a hydrophilic foam with a C.E.C. of from 1.0 to 1.5. As previously noted, **Pruitt '441 is directed toward filled foams.** Pruitt '441 does not work without a filler; if it did, such would have been disclosed. Sterility is not inherent to filled foams nor is there any mention of sterility in Pruitt '441. Since the present invention does not introduce any fillers to the matrix, there is less possibility to contaminate the matrix and render it un-sterile. Sterile materials conform to Agricultural requirements currently in place thus making it easier to ship plants and the media materials across national borders. Neither reference is an unfilled foam material with a C.E.C. ranging from 1.0 to 1.5, with sterility which has been previously noted as a necessary requirement when shipping plants internationally or has optimum pore sizes and porosity for fluid transfer to the plant. It may be obvious to one of ordinary skill in the art that air water ratios can be altered with the addition of fillers, but it is not obvious how to obtain air water ratios without the use of fillers. When one puts additives in foam, pore size is exceptionally difficult to control. Those skilled in the art would know that fact. Thus pore size is not inherent. Furthermore chemical reactions that take place in filled foam are such that sterility is not inherent in filled foams.

As previously noted the claim of pore size and porosity is a further description of the unique unfilled foam with unexpected properties.

One of ordinary skill in the art would realize that polyurethane foam cannot be made without an isocyanate being one of the ingredients. The present invention uses a unique **unfilled** foam with unexpected properties that support plant growth.

The invention of Pruitt is based on the additions of ion exchange additives. It is not obvious to one of ordinary skill in the art that polymeric diphenylmethane diisocyanate would impart the unique properties to the unfilled foam of the present invention.

Although Pruitt '441 discloses 4,4'-methylenebis(phenyl isocyanate), the use of this material in his invention of filled polyurethane foam would not produce a foam matrix with the unexpected unique properties of the present invention of a non-filled foam. Pruitt '441 does not disclose a C.E.C. ranging from 1.0 to 1.5 and is directed toward a filled foam. There is no showing that if the foams were modified by Pruitt '441 that it would have a 1.0 to 1.5 C.E.C. C.E.C. is not predictable as it depends upon the structure of molecules that make the foam. Different ingredients in making foam will give different C.E.C. Density also changes the C.E.C. as do the foaming ingredients and the thousands of variables of additives, each with a different C.E.C.

Pruitt (US 2,988,441) and Garrett (US 5,617,672),disclose in the prior art various growth media of foams, which **use filler in the growth media because un-filled polyurethane foam was not believed to be a suitable growth media. It was unexpected to discover that the un-filled polyurethane foam of the present invention has the required properties of a suitable growth media, pH, porosity, pore size, C.E.C. ranges and foam material.**

In cases which are similar to the present circumstances, the courts have ruled that beyond looking at the prior art to determine if it suggests doing what the inventor has done, one must consider if the prior art provides an expectation of succeeding in the endeavor. *In re Dow Chem.,*

837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988), "Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure." Id. As noted by the court in the case of *In re Clinton,* "Obviousness does not require absolute predictability, but a reasonable expectation of success is necessary." *In re Clinton,* 527 F.2d 1226, 1228, 188 U.S.P.Q. 365, 367 (C.C.P.A.1976).

As noted by the Court in the case of *In re Gordon,* the mere fact that a prior art reference could be modified to achieve the claimed invention does not make the modification obvious unless the prior art suggested the desirability of the modification. *In re Gordon,* 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir.1984); see also *In re Laskowski,* 871 F.2d 115, 117, 10 U.S.P.Q.2d 1397, 1398 (Fed. Cir. 1989), and *Ex parte Levengood,* 28 U.S.P.Q.2d 1300, 1302 (Bd. Pat. App. & Int. 1993). Applicants respectfully submit that nowhere in the art of record is there any suggestion to arrive at the claimed novel composition of the present invention.

The court in *Minnesota Mining & Manufacturing Co. v. Johnson &Johnson Orthopaedics, Inc.,* 24 USPQ2d 1321 (Fed. Cir 1992) held that: "Although [a patent's] specific claims are subsumed in [a prior art reference's] generalized disclosure..., this is not literal identity." The *Minnesota* court held that the reference's ranges were so broad as to be meaningless, and provided no guidance on how to construct a product with the patented invention's benefits. The court in *In re Baird,* 29 USPQ2d 1550 (Fed. Cir. 1994), held that "The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious." The *Baird* court further held that a disclosure to numerous compounds does not render obvious a claim to three compounds, particularly when that disclosure indicates a preference leading away from the claimed compounds.

As previously argued, none of the cited references singularly or in combination suggest teach or obviate the present invention and indeed cannot be combined. The Examiner has engaged in hindsight application, a prohibited rejection since *John Deere* to combine the cited prior art references against the present invention.

(2) The Examiner's rejection of Claims 16-23, 25 and 26 under 35 USC 103(a) as unpatentable over US Rubinate/Suprasec in view of Pruitt '441 is not correct and should be reversed.

Claims 16-23, 25 and 26 are directed toward a horticultural growing medium capable of supporting plant growth in the form of a substantially sterile unfilled foam material made of polymeric diphenylmethane diisocyanate taken from a group consisting of one or more of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), crude MDI, products of crude diaminodiphenyl methane including polymeric MDI or a mixture of the same, having at least 50 of its pores ranging in size between 10 and 200 microns with a cation exchange capacity ranging from about 1.0 to about 1.5 and a total porosity ranging from about 85% to about 95%

The Rubinate/Suprasec reference only represents a list of isocyanates supplied by Huntsman and does not disclose **a sterile foam or that the foam can be used for plant growth, or that the foam has specific porosity, pore size, pH or C.E.C.** This reference is simply a list showing isocynates supplied by Huntsman, the raw chemical material of various foams, which chemicals are poisonous. Rubinate/Suprasec doe not teach the inventive foam. **It should be noted that methyl isocynate is the chemical which leaked from a tank at the UCIL Bhopal plant, killed thousands of people and injured additional thousands in Bhopal, India.** There is no showing that diphenylmethane diisocyanates is a medium capable of supporting plant growth. MDI, a poisonous

liquid will not support plant growth.

The Pruitt '441 reference is directed towards a medium for the growth and propagation of potted plants using polyurethane, rubber and vinyl resins having added synthetic ion exchange resins to produce an open celled foam. It is an object of the invention to provide a nutrient containing foamed matrix, an MDI based foam. As noted in Col 2 lns. 17-24 "It has been discovered that when polymeric materials which are foamable to form a stable open-celled foam structure are mixed with plant nutrients in chemical combination with a water-insoluble ion exchange resin and thereafter foamed, stable synthetic water-insoluble foamed product results which provides a unitary plant growing medium for intensive plant culture." The term "plant nutrients " is defined to mean calcium, nitrogen, phosphorous, sulfur, potassium and magnesium. The '441 reference also embraces the additions of micronutrients; boron, manganese, iron, zinc, molybdenum and copper which are necessary for intensive plant growth. These nutrients are supplied in chemical concentrations with water insoluble synthetic ion exchange resins. As further noted on Col 2. Lns 51 - 55 "The invention is particularly concerned with a matrix prepared from the three major classes of resins known to produce open celled foam structure, namely, the polyurethanes, the rubbers and the vinyl foams, * * * ." Garnett does not use any of these three classes foams.

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It would not be obvious to one of ordinary skill in the art at the time of the invention to

modify the medium of Pruitt '441 by eliminating the filler because **unfilled polyurethane foam is not hydrophilic nor does it have a C.E.C. of from 1.0 to 1.5.** To overcome an inherently poor C.E.C., Pruitt adds a synthetic anion exchange resin (col. 13, lns. 57-75) and adds an inert compound having a high water-holding capacity in order to render the matrix hydrophilic (See example 1).

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As previously noted the claim of pore size and porosity is a further description of the unique unfilled foam with unexpected properties.

One of ordinary skill in the art would realize that polyurethane foam cannot be made without an isocyanate being one of the ingredients. The present invention uses a unique **unfilled** foam with unexpected properties that support plant growth.

The invention of Pruitt is based on the additions of ion exchange additives. It is not obvious to one of ordinary skill in the art that polymeric diphenylmethane diisocyanate would impart the unique properties to the unfilled foam of the present invention.

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As previously noted, the courts have ruled that beyond looking at the prior art to determine if it suggests doing what the inventor has done, one must consider if the prior art provides an

expectation of succeeding in the endeavor. *In re Dow Chem., supra.*, "Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure." Id.

The previous discussion of *In re Gordon, supra.* and *Minnesota Mining & Manufacturing Co. v. Johnson &Johnson Orthopaedics, Inc., supra.*, also apply to this rejection.

Applicants respectfully submit that nowhere in the art of record is there any suggestionor combination to arrive at the claimed novel composition of the present invention.

As previously argued, none of the cited references singularly or in combination suggest, teach or obviate the present invention and indeed cannot be combined. The Examiner has engaged in hindsight application, a prohibited rejection since *John Deere* to combine the cited prior art references against the present invention.

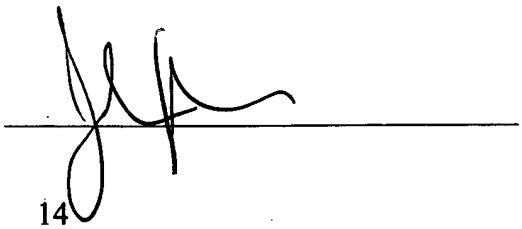
SUMMARY OF ARGUMENT

The respective grounds of final rejection of the claims of this application under 35 USC 103(a) are incorrect for the reasons advanced above. Reversal thereof by the Honorable Board of Patent Appeals and Interferences is therefore requested and is earnestly solicited.

Our check in the amount of $250.00 is attached to cover the cost of filing this Brief and two copies. Oral hearing will be requested during the rebuttal time period. If any additional fees are incurred, kindly charge the same to our Deposit Account No. 07-1340.

Respectfully submitted,

GIPPLE & HALE



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APPENDIX

1. A horticultural growing medium comprising:

a flexible diphenylmethane diisocyanate foam material without filler material having a cation exchange capacity ranging from about 1.0 to about 1.5,

said horticultural growing medium being capable of supporting plant growth.

2. The horticultural growing medium of claim 1, wherein said cation exchange capacity is about 1.25.

3. The horticultural growing medium of claim 1, wherein said diphenylmethane diisocyanate foam material is taken from a group consisting of polymeric diphenylmethane diisocyanate, crude diphenylmethane diisocyanate, 4,4'-, 2,4'-, 2,2'-diphenylmethane diisocyanate.

4. The horticultural growing medium of claim 1, wherein said diphenylmethane diisocyanate foam material is polymeric diphenylmethane diisocyanate.

5. The horticultural growing medium of claim 1, wherein said diphenylmethane diisocyanate foam material is one or a mixture of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), polymeric MDI, crude MDI, namely, products of crude diaminodiphenyl methane or a mixture of the same

6. The horticultural growing medium of claim 1, wherein said foam material has a neutral pH ranging from 6.8 to 7.8.

7. The horticultural growing medium of claim 1, wherein said foam material is highly porous and maintains a 60 to 40 air to water ratio.

8. The horticultural growing medium of claim 1, wherein said foam material has at least 50% of its pores by foam volume ranging in size between 10 and 200 microns.

9. The horticultural growing medium of claim 1, wherein said foam material has about 50%

of its pores by foam volume ranging in size from 40 to about 90 microns.

10. The horticultural growing medium of claim 1, wherein said foam material has pores ranging from 20% to about 25% by foam volume which range in size between about 0.2 microns to about 10 microns.

11. The horticultural growing medium of claim 1, wherein said foam material has pores ranging from about 25% to about 35% by foam volume which range in size between about 300 microns to about 800 microns.

12. The horticultural growing medium of claim 1, wherein said foam material is substantially sterile.

13. The horticultural growing medium of claim 1, wherein said foam material has pores of about 30% by foam volume which range in size between about 300 microns to about 800 microns.

14. The horticultural growing medium of claim 1 wherein said foam material has a total porosity ranging from 85% to 95%.

15. The horticultural growing medium of claim 1 wherein said foam material has a total porosity of about 90% to 92%.

16. A horticultural growing medium comprising:

a sterile hydrophilic unfilled foam material made of diphenylmethane diisocyanate having at least 50% of its pores by foam volume ranging in size between 10 and 200 microns with a cation exchange capacity ranging from about 1.0 to about 1.5, said foam material having a total porosity ranging from about 85% to about 95%;

said horticultural growing medium being capable of supporting plant growth.

17. The horticultural growing medium of claim 16, wherein said foam material is at least one diphenylmethane diisocyanate taken from a group consisting of crude, polymeric, 4,4'-, 2,4'- and

2,2'-diphenylmethane diisocyanate.

18. The horticultural growing medium of claim 16, wherein said foam material is polymeric diphenylmethane diisocyanate.

19. The horticultural growing medium of claim 16, wherein said foam material is one or more of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), crude MDI, polymeric MDI or a mixture of the same.

20. A horticultural growing medium comprising:

a substantially sterile unfilled foam material made of polymeric diphenylmethane diisocyanate taken from a group consisting of one or more of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), crude MDI, products of crude diaminodiphenyl methane including polymeric MDI or a mixture of the same, having at least 50 of its pores ranging in size between 10 and 200 microns with a cation exchange capacity ranging from about 1.0 to about 1.5, with a total porosity ranging from about 90% to about 92%,

said horticultural growing medium being capable of supporting plant growth.

21. A horticultural growing medium as claimed in claim 20 wherein said foam material is a sheet with seeds secured thereto.

22. A horticultural growing medium as claimed in claim 20 wherein said foam material is a shaped block with an aperture cut therein.

23. A horticultural growing medium as claimed in claim 20 wherein said cation exchange capacity is about 1.0.

24. (Canceled)

25. A horticultural growing medium comprising:

a hydrophilic, substantially sterile diphenylmethane diisocyanate foam material without filler

material taken from a group consisting of polymeric diphenylmethane diisocyanate, crude diphenylmethane diisocyanate, 4,4'-, 2,4'-, 2,2'-diphenylmethane diisocyanate and having a neutral pH ranging from 6.8 to 7.8, said material having a cation exchange capacity ranging from about 1.0 to about 1.5,

said horticultural growing medium being capable of supporting plant growth.

26. A horticultural growing medium comprising:

a hydrophilic flexible sterile foam material made of diphenylmethane diisocyanate said foam material being taken from a group consisting of crude, polymeric, 4,4'-, 2,4'- and 2,2'-diphenylmethane diisocyanate having at least 50% of its pores by foam volume ranging in size between 10 and 200 microns with a cation exchange capacity ranging from about 1.0 to about 1.5, said foam material having a total porosity ranging from about 85% to about 95%;

said horticultural growing medium being capable of supporting plant growth.